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1962

TOWN OF FERGUS

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ANNUAL REPORT

ON

TOWN OF FERGUS

SEWAGE TREATMENT PLANT

OWRC PROJECT - 58-S-23

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FERGUS SEWAGE TREATMENT PLANT

OPERATED FOR

THE TOWN OF FERGUS

BY

THE ONTARIO WATER RESOURCES COMMISSION

Mr. A. M. Snider	Chairman
Dr. A. E. Berry	General Manager
Mr. D. S. Caverly	Assistant General Manager, and Director of Plant Operations
Mr. B. C. Palmer	Assistant Director, Division of Plant Operations
Mr. D. A. McTavish and Mr. A. C. Beattie	Project Engineers, Division of Plant Operations
Mr. B. W. Hansler	Assistant Project Engineer, Division of Plant Operations

Prepared by the

Division of Plant Operations

FERGUS WATER POLLUTION CONTROL PLANT

PROJECT HISTORY

The Town of Fergus approached the Ontario Water Resources Commission in April of 1958 to undertake the financing and operation of a new sewage treatment plant.

The plant was designed by Proctor & Redfern of Toronto, and Canadian Engineering & Contracting Company, Ltd. of Hamilton began construction in July of 1959.

In July 1960, two plant operators were hired and the plant was put into operation under the supervision of the Division of Plant Operations.

1961 was the first full year of operation of the plant. The two highlights of the year were the official opening of the plant and the acquisition of the plant site from the Gows.

The plant was officially opened on October 19, 1961 by Harry Worton, M.P.P. for Wellington South, assisted by Mayor W. K. Kenny of Fergus, and Mayor Robert Simpson of Arnprior, a member of the Ontario Water Resources Commission. A large number of students attended the official opening and were given guided tours of the treatment plant by OWRC staff. "Open House" to residents of Fergus was held on Sunday, October 29, 1961, and, in spite of poor weather, 75 local citizens toured the plant.

DESCRIPTION OF PLANT

General Description

The Fergus Sewage Treatment Plant is an activated sludge type using mechanical aeration. The 12 hour design flow is 600,000 gallons per day, which will treat the sewage from 4700 persons at a flow of 128 gallons per capita per day.

Inlet Sewer

There is an 18" diameter sewer which runs through an overflow chamber beside the two existing septic tanks. Excess flow in the inlet sewer overflows a weir and runs into the two septic tanks.

Septic Tanks

The two existing tanks are 36' x 22' x 10' deep and are used to provide partial treatment to the storm flow. The effluent from these tanks is discharged to the chlorine contact chamber and then to the river.

Coarse Bar Screen

A coarse bar screen is located in the overflow. This unit has 1" x ¼" bars at 4" centers to screen out large objects from the sewage.

Barminutor

The sewage which enters the plant passes through an 18 " barminutor which cuts and shreds the solid material.

Grit Removal

Inorganic material such as sand, grit, etc. is mechanically removed from the sewage by a Dorr-Oliver Type T detritor.

This unit has a manually cleaned bypass channel in case the mechanism breaks down.

Flow Measurement

After grit removal, the raw sewage passes through a 6" Parshall flume, which records the rate of flow and total flow for each day.

Primary Sedimentation Tank

The primary sedimentation tank is 40' square with a 9' side wall depth equipped with a Dorr-Oliver rotary scraper mechanism. The volume of the tank is 14,400 cubic feet which gives a detention time for 3.6 hours.

The function of this tank is to separate the solids from the incoming sewage by allowing them to settle to the bottom of the tank while the settled sewage flows over the effluent weirs.

The primary tank is oversized to accommodate the peak flows which occur in the spring. A bypass channel is provided around the primary tank. The outlet chamber from this tank is provided with an overflow weir to divert the flow in excess of 0.9 MGD to the effluent sewer.

Aeration Tank

The aeration tank consists of 3 units, each 24' square x 18'-8" SWD with a total volume of 22,080 cubic feet, which provides a detention period of 4.41 hours at a flow rate of 0.6 MGD. Each unit is provided with a high intensity mechanical aeration cell using the British Simplex Aeration Process.

Final Sedimentation Tank

The final sedimentation tank is 35' square with a 9' side wall depth equipped with a Dorr-Oliver rotary scraper mechanism. The volume of the tank is 11,025 cubic feet, which gives a detention time of 2.2 hours at a flow rate of 0.6 MGD with 25% return sludge.

Pump Building

The main building at the plant houses the combined office and laboratory, the chlorination room, a washroom and a pump room.

The following pumps are located in the pump room:

(a) One 150 GPM Fairbanks-Morse centrifugal raw sludge pump equipped with a 5 H.P. electric motor. This unit pumps raw sludge which is settled out in the primary sedimentation tank over to the digester.

(b) One 350 GPM Fairbanks-Morse centrifugal return sludge pump equipped with a variable speed drive and an electric motor. This pump is used to return the activated sludge from the bottom of the final sedimentation tank to the aeration tank.

(c) One 350 GPM Fairbanks-Morse centrifugal return sludge pump equipped with a variable speed drive and an electric motor. This is a standby unit.

Digester

The heated digester is 35' diameter x 22' SWD having a volume of 22,700 cubic feet. This volume allows for a capacity

of 4.8 cubic feet per capita. The digester is equipped with a Dorr-Oliver floating cover and a draft tube mixer. The sludge in the digester is heated by a Pacific Flush tank heat exchanger which is located in the digester building.

The sludge in the digester is heated to a temperature of 90° F., and it is broken down by bacterial action into (1) thick, black, odourless digested sludge (2) a relatively clear supernatant liquor which is returned to the aeration tank and (3) digester gas which is used in the heat exchanger to heat the digester. Standby fuel is oil. The digested sludge is run out on sand beds for drying and later disposal as a soil conditioner.

Sludge Drying Beds

There are four sand sludge drying beds each 80 feet long by 22½ feet wide, having a total area of 7,200 square feet.

Chlorination

A 200 lb/24 hour capacity Builders Providence gas chlorinator is located in the end of the main building.

Chlorine is injected into the outlet chamber of the final sedimentation tank, The chlorinated effluent flows in a chlorine contact chamber located near the outlet of the existing septic tanks.

The volume of the chlorine contact chamber is 911 cubic feet, which gives a contact period of 13.7 minutes.

The final effluent is discharged to the Grand River through a 30" outfall sewer.

OPERATING DATA AND RESULTS

The plant has given an average BOD reduction of 94 percent and an average SS reduction of 86 percent. One hundred and forty-nine tons of BOD and one hundred and twenty-nine tons of SS were removed during the year. The total flow through the plant was 130.87 million gallons.

There was a large variation of flow during the spring months which was due largely to storm water connections from the house roofs to the sanitary sewers. The average daily flow per month increased from February at 0.49 M.G.D. to 0.61 and 0.66 in March and April when the maximum amounts of rain per month occurred. It then decreased to 0.32 M.G.D. in May and remained at an average of 0.28 M.G.D. for the rest of the year. This has not become a serious problem as yet but if more storm water drains are connected to the sanitary system, extreme variations of flow during storms could result in a loss of activated sludge due to surging through the plant.

Low flows during 10 months of the year have retarded the efficiency of the plant,with respect to SS removed. The amount of aeration given to the activated sludge was more than required, but it could not be reduced because under normal conditions the mechanism was running at its minimum speed. As a result, the suspended solids in the final effluent were higher than normal. The low flow also made it necessary to return more activated sludge than was required because the pump was already at its minimum capacity. As a result, the solids in the aeration tank were a little higher than normal producing a low average pounds

of BOD per 100 pounds of mixed liquor suspended solids ratio of 10 with a corresponding high BOD reduction. From the graph showing percent of design flow versus percent of the time the daily flows are equal or greater than, the straight line represents a normal distribution of primarily sanitary sewage. The points at 70, 100 and 150 percent design flow are due to the influence of storm flows. Eight percent of the time the flow was equal or greater than design flow.

The average BOD and SS of the raw sewage was 277 and 254 ppm respectively. The design value is 200 ppm for each. It was found that 25 percent of the time the BOD (ppm) of the raw sewage was equal to or greater than the design value and 45 percent of the time the SS (ppm) of the raw sewage was also equal to or greater than the design value.

On a number of occasions in the month of June, the plant received shock discharges of skim milk from the local creamery. The first discharge came without warning at a time when the aeration system was being operated at its minimum aeration capacity. When the plant went septic, many complaints were received from nearby residents. The aeration section was increased to its design capacity in anticipation of more loads of milk but when these loads came, they again turned the plant septic but not for as long a time. In the fall, the aeration mechanism was gradually decreased to its minimum speed again.

Odours were again noticed in the latter part of August and the beginning of September from the drying beds. The source of the odours was probably the milk wastes, as they did not re-occur from either the plant or the drying beds after the milk wastes ceased coming to the plant.

Near the end of September the primary clarifier went septic. There was a considerable amount of bubbling and sludge was noted floating in the clarifier. The centrifugal raw sludge pump was continually loosing its prime. Supernatant which had a solids content equal to the raw sludge was being returned to the primary clarifier. On October 1st, a program began to prevent supernatant from returning to the primary clarifier by removing as much sludge to the beds and grounds as was pumped into the digester. Raw sludge was also pumped to the digester at a greater rate than it was being formed. It was estimated at the time that 2,000 to 2,500 gallons of raw sludge were being formed per day. Using this method, the primary clarifier cleared itself by October 29th and the raw sludge pump no longer lost its prime because of the sludge gas.

The amount of sludge to the digester increased sharply from 92,166 gallons in May to 363,600 in June and increased to 570,240 gallons in August. There was a slight decrease in September to 453,600 gallons. This increase in raw sludge was caused by the returning of supernatant to the primary clarifier. The supernatant had a high solids content which tended to build up the solids in the primary clarifier. In order to reduce the solids in the primary clarifier, more sludge was pumped to the digester with the result that more supernatant was returned to the clarifier and in some cases, it had higher solids content than the raw sludge. This resulted in a short circuiting effect and an overloading of the primary clarifier which caused it to go septic in October. It should be noted that after the supernatant was prevented from returning, the amount of sludge to the digester dropped to 37,200 gallons in December.

Further improvements were made on the plant grounds this year. The hill just north of the plant was cleared of scrub brush and fill was spread south of the plant to increase the amount of lawn around the plant. Painting of the plant machinery commenced in the fall and will be carried on next year.

The insulation around the digester started to show hair-line cracks. Proctor and Redfern were informed and arranged to have it patched with Keene's cement.

A new connecting pipe was installed between the parshall flume and the float chamber in September. This became necessary when it was found that the existing pipe was approximately one inch above the floor of the flume when the bottom of the pipe should have been at the same elevation as the floor of the Parshall flume. The flow meter was adjusted on September 6th. It was found that all previous flow readings were 100,000 gallons per day low. Operating results, plant loadings and plant efficiencies are shown in the following tables.

FLOW RECORDS MGD

FERGUS POPULATION 3,928

MONTH	ABSOLUTE MAXIMUM	ABSOLUTE MINIMUM	MAXIMUM 24 HOUR FLOW	MINIMUM 24 HOUR FLOW	AVERAGE 24 HOUR FLOW	AVERAGE DAILY WKDY FLOW	AVERAGE DAILY WKEND FLW	TOTAL MONTHLY FLOW MG	AVERAGE FLOW GAL/ CAP/DAY	BY-PASSING (HRS)	
										RAW	PRIMARY CLAR.
JANUARY	0.47	0.15	0.32	0.24	0.30	0.27	0.26	9.26	77	NIL	3½
FEBRUARY	1.40	0.20	1.07	0.30	0.49	0.50	0.46	13.84	125	NIL	5½
MARCH	1.60	0.20	1.10	0.27	0.61	0.63	0.58	18.99	156	NIL	22
APRIL	1.20	0.30	1.07	0.36	0.66	0.69	0.64	19.72	168	NIL	46
MAY	1.40	0.20	0.48	0.26	0.32	0.33	0.29	10.02	81	NIL	64
JUNE	1.10	0.17	0.40	0.23	0.28	0.29	0.27	8.51	71	NIL	7½
JULY	1.50	0.16	0.49	0.23	0.30	0.30	0.31	9.33	76	NIL	NIL
AUGUST	0.35	0.15	0.38	0.20	0.23	0.24	0.21	7.15	59	NIL	NIL
SEPT.	1.00	0.11	0.38	0.21	0.25	0.24	0.25	7.42	64	NIL	NIL
OCT.	1.20	0.13	0.66	0.20	0.32	0.31	0.32	9.76	82	NIL	25
NOV.					0.31*			9.31*	79	NIL	NIL
DEC.					0.25**			7.56**	64	NIL	NIL
TOTAL								130.87			173.5
AVERAGE PER MON.	1.12	0.18	0.64	0.25	0.36	0.38	0.34	10.91	92		14.5

* Flows are estimated from October flows as the flow meter is out of order.

**Flows are estimated on the previous 3 months as the flow meter is out of order.

NOTE

1. MGD - Million gallons per day of sewage flow.

BOD, S.S. & GRIT REMOVAL

MONTH	BOD				SS				GRIT REMOVAL	
	INFL. PPM	EFFL. PPM	% REDCTN.	TONS REMOVED	INFL. PPM	EFFL. PPM	% REDCTN.	TONS REMOVED	CUBIC FT	CU. FT. PER MG
JANUARY	178	6	97	8.0	259	44	83	10.0	7	1.1
FEBRUARY	198	20	90	12.3	246	61	75	12.8	5	0.5
MARCH	108	12	89	9.1	168	44	74	11.8	14	0.9
APRIL	75	9	88	6.5	123	27	78	9.5	5	0.3
MAY	150	13	91	6.9	231	70	70	8.1	9	1.3
JUNE	1450	14	99	61.2	372	15	96	15.2	6	1.1
JULY	91	4	96	4.1	164	8	95	7.3	5	0.5
AUGUST	348	17	95	11.8	377	80	79	10.6	11	1.5
SEPT.	230	16	93	8.0	547	21	96	19.5	12	1.6
OCT.	214	10	95	10.0	209	16	92	9.4	10	1.0
NOV.	126	8	94	5.5*	155	9	94	6.8*	10	1.1
DEC.	155	8	95	5.6*	199	13	94	7.7*	6	1.3
TOTAL				149.0				128.7	100	
AVERAGE	277	11	94	12.4	254	34	86	10.7	8	1.0

* Based on estimated flows.

NOTE

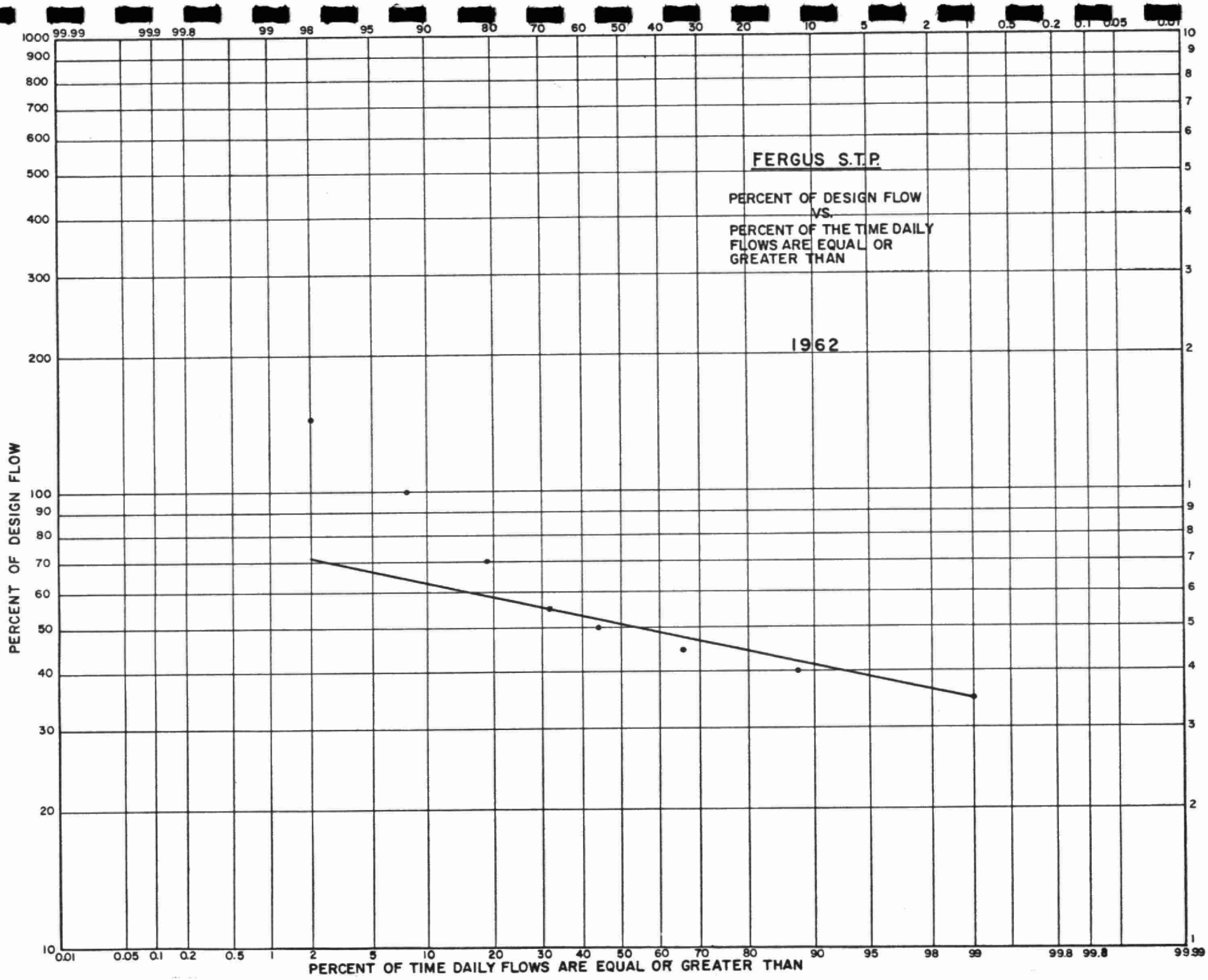
1. BOD - Biochemical oxygen demand.
2. SS - Suspended Solids.
3. PPM - Parts per million.
4. Expected percent reduction of BOD by the A.S.C.E. sewage treatment plant design manaul is from 90-95%.
5. Influent - raw sewage.
6. Effluent - final effluent.

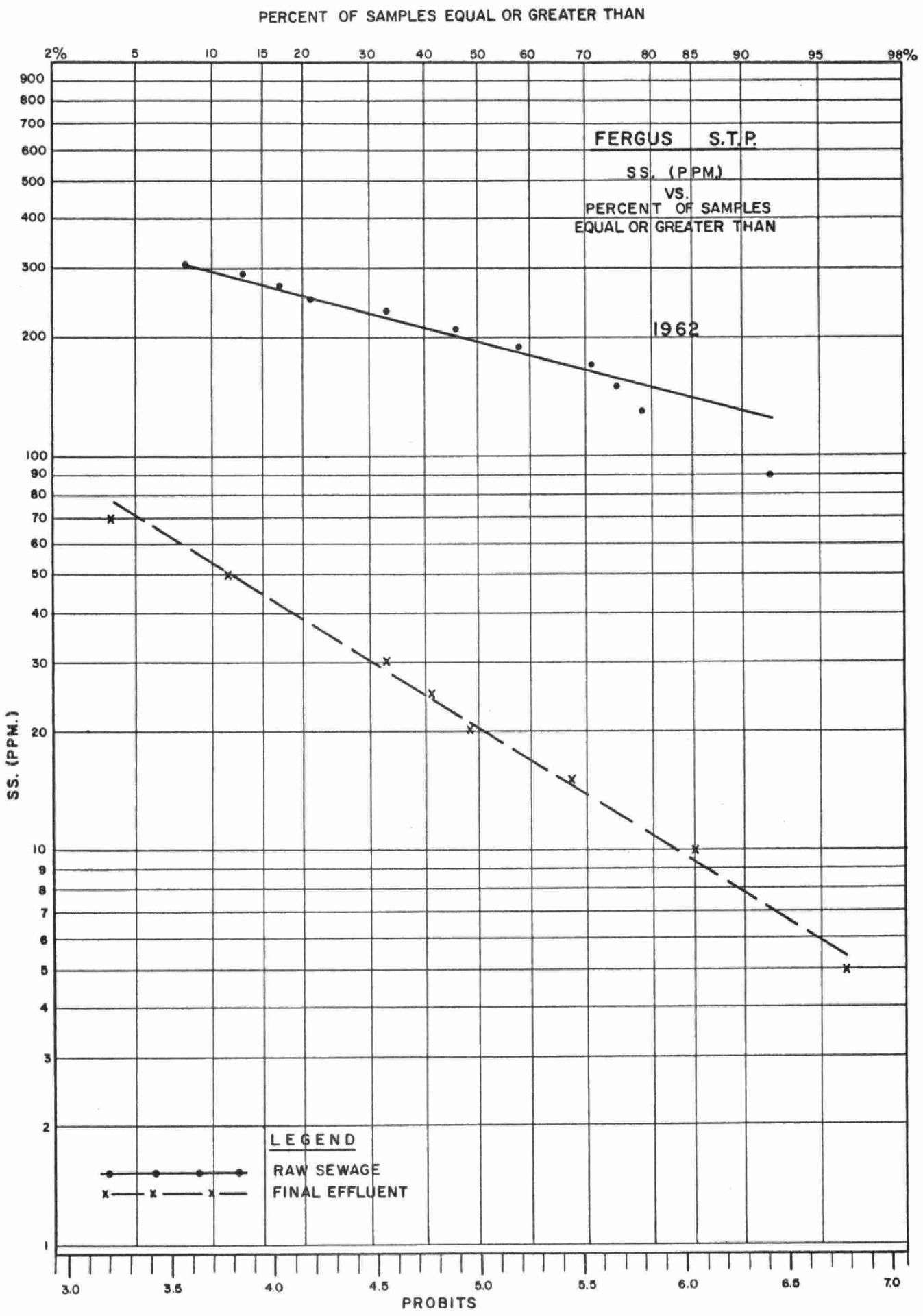
AERATION SECTION

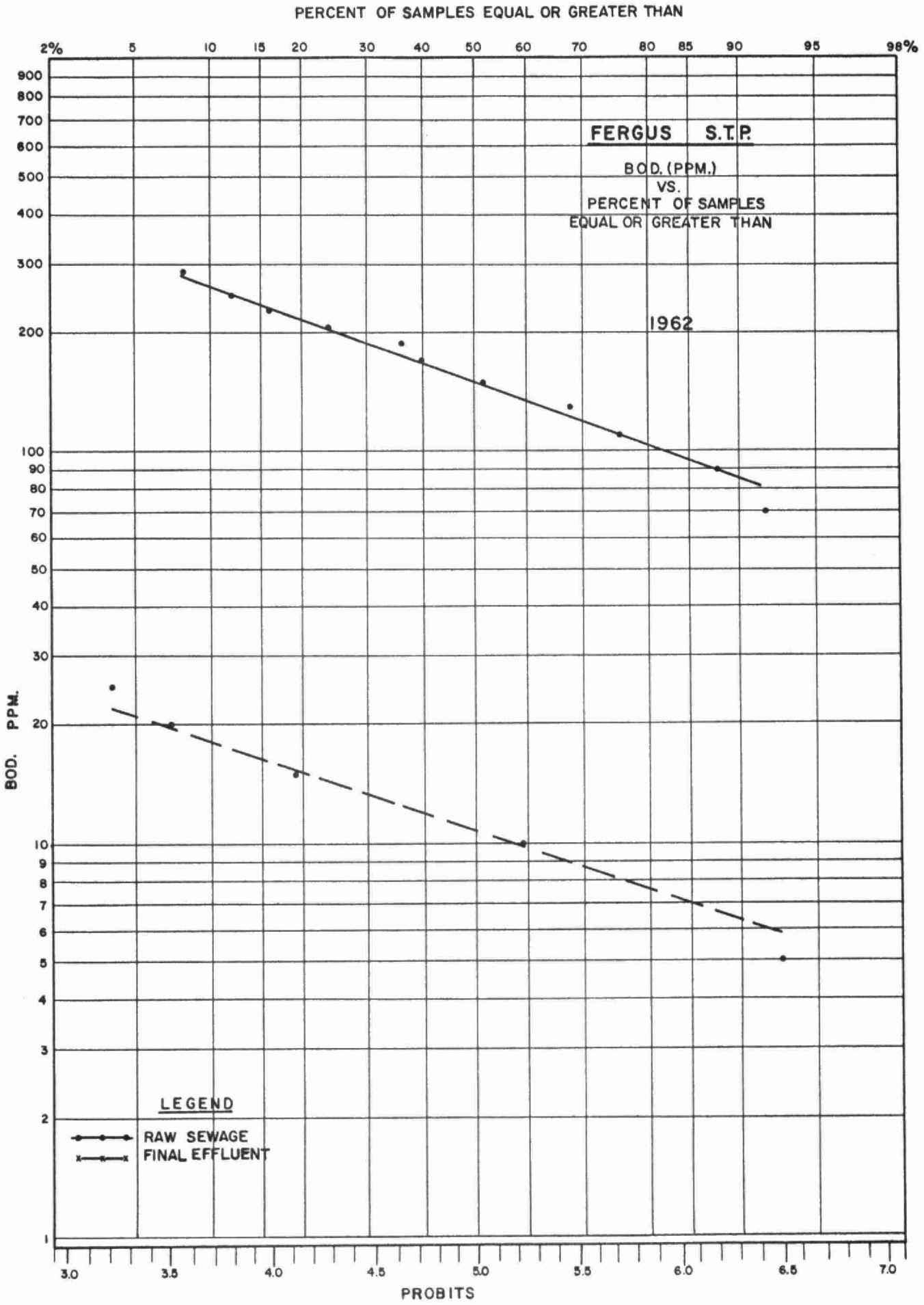
MONTH	PRIMARY EFFLUENT BOD PPM	M.L.S.S. PPM	LBS. BOD PER 100 LBS. MLSS.	PERCENT REDUCTION OF BOD	TONS BOD REMOVED
JANUARY	43	2460	3	86	1.7
FEBRUARY	67	2464	7	70	3.3
MARCH	34	1959	9	65	2.1
APRIL	55	1517	13	84	4.5
MAY	56	1779	5	77	2.2
JUNE	315	2379	14	96	12.8
JULY	76	2959	3	95	3.4
AUGUST	305	3326	8	94	4.1
SEPT.	257	3200	36	94	8.9
OCTOBER	136	2102	15	93	6.2
NOVEMBER	41	1905	5*	81	1.5*
DECEMBER	63	1669	7*	87	2.1*
TOTAL					52.8
AVERAGE PER MONTH	121	2310	10	85	4.4

NOTE:

1. Primary Effluent - Primary Effluent
2. BOD - Biochemical Oxygen Demand
3. PPM - Parts per million
4. MLSS - Mixed Liquor Suspended Solids in the aeration tank.
5. Design Loadings - FSIWA Manual of Practice No. 8
   lb. BOD/100 lbs. MLSS = 20 to 30


FERGUS S.T.P.
PERCENT OF DESIGN FLOW
VS.
PERCENT OF THE TIME DAILY
FLOWS ARE EQUAL OR
GREATER THAN
1962
PERCENT OF DESIGN FLOW
PERCENT OF TIME DAILY FLOWS ARE EQUAL OR GREATER THAN
1000 900 800 700 600 500 400 300 200 100 90 80 70 60 50 40 30 20 10
99.99 99.9 99.8 99 98 95 90 80 70 60 50 40 30 20 10 5 2 1 0.5 0.2 0.1 0.05 0.01
0.01 0.05 0.1 0.2 0.5 1 2 5 10 20 30 40 50 60 70 80 90 95 98 99 99.8 99.8 99.99


PERCENT OF SAMPLES EQUAL OR GREATER THAN
2%
5
10
15
20
30
40
50
60
70
80
85
90
95
98%
900
800
700
600
500
400
300
200
100
90
80
70
60
50
40
30
20
10
9
8
7
6
5
4
3
2
1
SS. (PPM.)
FERGUS S.T.P.
SS. (PPM.)
VS.
PERCENT OF SAMPLES
EQUAL OR GREATER THAN
1962
LEGEND
RAW SEWAGE
FINAL EFFLUENT
3.0
3.5
4.0
4.5
5.0
5.5
6.0
6.5
7.0
PROBITS


PERCENT OF SAMPLES EQUAL OR GREATER THAN
2%
5
10
15
20
30
40
50
60
70
80
85
90
95
98%
FERGUS S.T.P.
BOD. (PPM.)
VS.
PERCENT OF SAMPLES
EQUAL OR GREATER THAN
1962
BOD. PPM.
900
800
700
600
500
400
300
200
100
90
80
70
60
50
40
30
20
10
9
8
7
6
5
4
3
2
1
LEGEND
RAW SEWAGE
FINAL EFFLUENT
3.0
3.5
4.0
4.5
5.0
5.5
6.0
6.5
7.0
PROBITS

DIGESTER OPERATION & SLUDGE REMOVAL

MONTH	SLUDGE TO DIGESTER					SLUDGE TO BEDS		
	GALLONS TO DIGESTER	GALLONS PER MG FLOW	PERCENT OF TOTAL FLOW	PERCENT SOLIDS	POUNDS	GALLONS	PERCENT SOLIDS	POUNDS
JANUARY	65,070	7,030	0.7	4.82	31,400	5,620		
FEBRUARY	94,860	8,570	0.7	2.90	27,600	11,240	3.22	3,620
MARCH	99,975	6,290	0.5	5.65	56,400	5,620		
APRIL	77,580	4,630	0.4	5.20	40,400		1.94	
MAY	92,166	13,300	0.9	5.37	49,500		4.11	
JUNE	363,600	65,900	4.3			18,700		
JULY	367,200	39,400	3.9	5.00	184,000	5,620		
AUGUST	570,240	79,700	8.0	4.88	278,000	15,000	3.65	5,480
SEPTEMBER	453,600	61,100	6.1	3.28	149,000	35,600	3.20	11,400
OCTOBER	147,780	15,100	1.5	3.64	53,500	129,500	3.00	38,900
NOVEMBER	34,400	3,690*	0.4*	4.64	16,000	38,000	2.94	11,170
DECEMBER	37,200	4,930*	0.5*	3.99	14,800	14,000	2.56	3,580
TOTAL	2,403,671				900,600	278,900		74,150
AVERAGE PER MONTH	200,306	25,803	2.2	4.49	75,050	23,242	3.08	12,358

* Based on estimated flows.

SEWAGE SLUDGE GAS PRODUCTION

FUEL OIL CONSUMPTION

DATE	GAS PRODUCED (FEET^3)	GAS TO WASTE (FEET^3)	GAS CONSUMED (FEET^3)	OIL CONSUMED (GALLONS)	B.T.U.'s CONSUMED
JANUARY	156,100	0	156,100	430	154,000,000
FEBRUARY	136,405	0	136,405	325	126,000.000
MARCH	153,368	0	153,368	280	138,000,000
APRIL	127,833	0	127,883	115	91,700,000
MAY	116,823	3,933	112,890	50	74,700,000
JUNE	127,148	58,483	68,665	0	41,200,000
JULY	174,712	84,550	90,162	0	54,200,000
AUGUST	220,163	90,174	129,989	0	78,000,000
SEPTEMBER	179,045	13,890	165,155	120	115,800,000
OCTOBER	111,703	0	111,703	320	111,700,000
NOVEMBER	94,202	0	94,202	640	146,100,000
DECEMBER	89,963	0	89,963	795	165,000,000
TOTAL	1,687,465	251,030	1,436,485	3,075	1,296,400,000
AVERAGE PER MONTH	140,622	20,919	119,707	256	108,000,000

Assumption

B.T.U.'s of sewage gas = 600 per cu. ft.

B.T.U.'s of fuel oil = 140,000 per gallon.

Note:

1. ft.^{3} - cubic feet
2. B.T.U. - British Thermal Units

OPERATORS

The plant was operated 10 hours per day from 7 AM to 5 PM for 5 days a week and was checked for 2 hours on Saturdays and Sundays during the year.

Mr. Roy Bridge was the Chief Operator and Mr. Arthur Carlaw was the assisting operator. Both operators worked 8 hours per day with Mr. Brdige starting at 7 AM and Mr. Carlaw at 9 AM and finishing at 3 PM and 5 PM respectively. Each operator checked the plant every other weekend and 4 hours were taken off the following week in order to keep their working hours at 40 per week.

SERVICING OF PROJECT BY HEAD OFFICE

The plant was inspected every month by a project engineer. Some of the more important work supervised by head office included the clearing of the milk waste that caused the plant to go septic, correction of the flow meter, clearing the primary clarifier from its septic condition, painting the plant machinery and improving the plant grounds. The plant performance was reviewed continually by the project engineer to ensure that it was running at its maximum efficiency.

The plant is checked at least once a year by the Division of Sanitary Engineering to ensure that the plant is producing the best effluent possible. Also the equipment is inspected at least once a year by the OWRC technical staff. Extra work done by the OWRC technical staff, during the year included repair of the barminutor, flow meter and flow meter motor.

There is also considerable work done in the statistical, purchasing and payroll departments and in the OWRC laboratory that pertain to the plant.

The Statistic Department calculates and records all the operating data available. They also record all the insurance premiums and their cost for the plant.

The Purchasing Department buys all items for the plant over 10 dollars that have been ordered by the Project Engineer and approved by the OWRC.

Payroll, pension and workman's compensation for the operators are paid by the Payroll Department.

Samples of raw sewage, primary effluent, final effluent, raw sludge, supernatant and digested sludge were sent to the OWRC laboratory once a week. There, BOD, total solids, suspended solids and dissolved solid analysis were performed on the raw sewage, primary effluent and final effluent. Total solids, suspended solids, dissolved solids and volatile acid analysis were carried out on raw sludge, supernatant and digested sludge. The results of the tests were sent to the Chief Operator and to Head Office.

OPERATING COST DATA

The 1962 budget exceeded the actual expenditures by $577.04. Below is a chart which lists the budget, the actual expenditures and the difference between the two for each separate item. A plus sign under the difference column indicates that the actual expenditures were less than the budget and a minus sign indicates that the budget was exceeded.

ITEM	1962 BUDGET	1962 ACTUAL	DIFFERENCE
Payroll	$ 7,830	$ 8,123.95	- 293.95
Water	100	125.55	- 25.55
Fuel	490	474.52	+ 15.48
Power	1,440	1,039.41	+ 400.59
Chemicals	338	32.13	+ 305.87
General Supplies	600	583.23	+ 16.77
Equipment	180	233.61	- 53.61
Repair and Maintenance	820	957.88	- 137.88
Sundry	800	450.68	+ 349.32
	$ 12,598	$ 12,020.96	

Payroll

Budget - $ 7,830 Actual - $ 8,123.95 Difference - $ 293.95

The deficit of $ 293.95 in the payroll budget was due to the $ 98.03 of accrued overtime plus the fact that the two operators elected to have their pension plan extended back from when they went on permenant staff to when they started employment with the OWRC. Operators do not contribute to a pension plan during the

time when they are on temporary staff which is usually 6 months. They started to pay $ 4.21 and $ 4.30 per day respectively on their first pay in February which the Commission pays an equivalent amount.

Water

Budget - $ 100 Actual - $ 125.55 Difference - $ 25.55

The deficit of $ 25.55 is probably due to the fact that water was used for watering the plant grounds during late spring, summer and early fall. This fact makes the water bill very difficult to predict.

Fuel

Budget - $ 490 Actual - $ 474.52 Difference - + $ 15.48

The budget estimate for fuel was 3,000 gallons and the actual fuel consumed was 3,075 gallons.

Power

Budget - $ 1,440 Actual - $ 1,039.41 Difference - + $ 400.59

The difference of $ 400.59 was due to a high estimate of $ 120 per month in 1962 compared to the average actual power bill of $ 86.62 per month.

Chemicals

Budget - $ 338 Actual - $ 32.13 Difference - + $ 305.87

Lab chemicals and 5 gallons of polycide were purchased for $ 32.13. Two hundred and thirty-eight dollars ($ 238) were allowed for effluent chlorination in case it was necessary. There was no effluent chlorination in 1962 which accounts for the difference of $ 305.87 not spent on chemicals.

General Supplies

Budget - $ 600 Actual - $ 583.23 Difference - + $ 16.77

Items purchased under general supplies include paint, pump packing, hardware account, petty cash spent by the operator, paper towels, a new varibelt plus small electrical equipment such as electric switches and cables.

Equipment

Budget - $ 180 Actual - $ 233.61 Difference - - $ 53.61

A Ferranti voltmeter was purchased for $ 80.80 and $ 144.29 was spent on 300 feet of rubber hose.

Repair and Maintenance

Budget - $ 820 Actual - $ 957.88 Difference - - $ 137.88

Some of the larger items that required repair and maintenance include $ 82.95 for work on the flow meter by Foxboro Company, $ 410.40 for work on the barminutor by C. E. Napier and $ 344 for fill and leveling fill by Neilson Brothers. The difference in the expenditures was used for various electrical work.

Sundry

Budget - $ 800 Actual - $ 450.68 Difference - + $ 349.32

The sundry includes Bell Telephone rates, Sunshine Uniform, Workmen's Compensation (24.60) and insurance (24.28). The largest item was $ 100.00 for bulldozer work done by E. Chamberlain. Three hundred dollars ($ 300) were allowed for taxes and $ 260 were allowed for insurance. Taxes were not charged to the project and only $ 24.28 were charged for insurance. This, to a large extent, accounts for being under the budget by $ 349.32.

The total operating cost per capita for the citizens of Fergus during the year amounted to $ 3.07 with an average of 26 cents per month. It cost on the average 6 cents per pound of BOD removed and 5 cents per pound of suspended solids removed and $ 104 per month per million gallons of sewage treated.

The reserve for contingencies on December 31, 1962 was $ 5,852.10.

The following table shows the monthly project operation statements.

1962

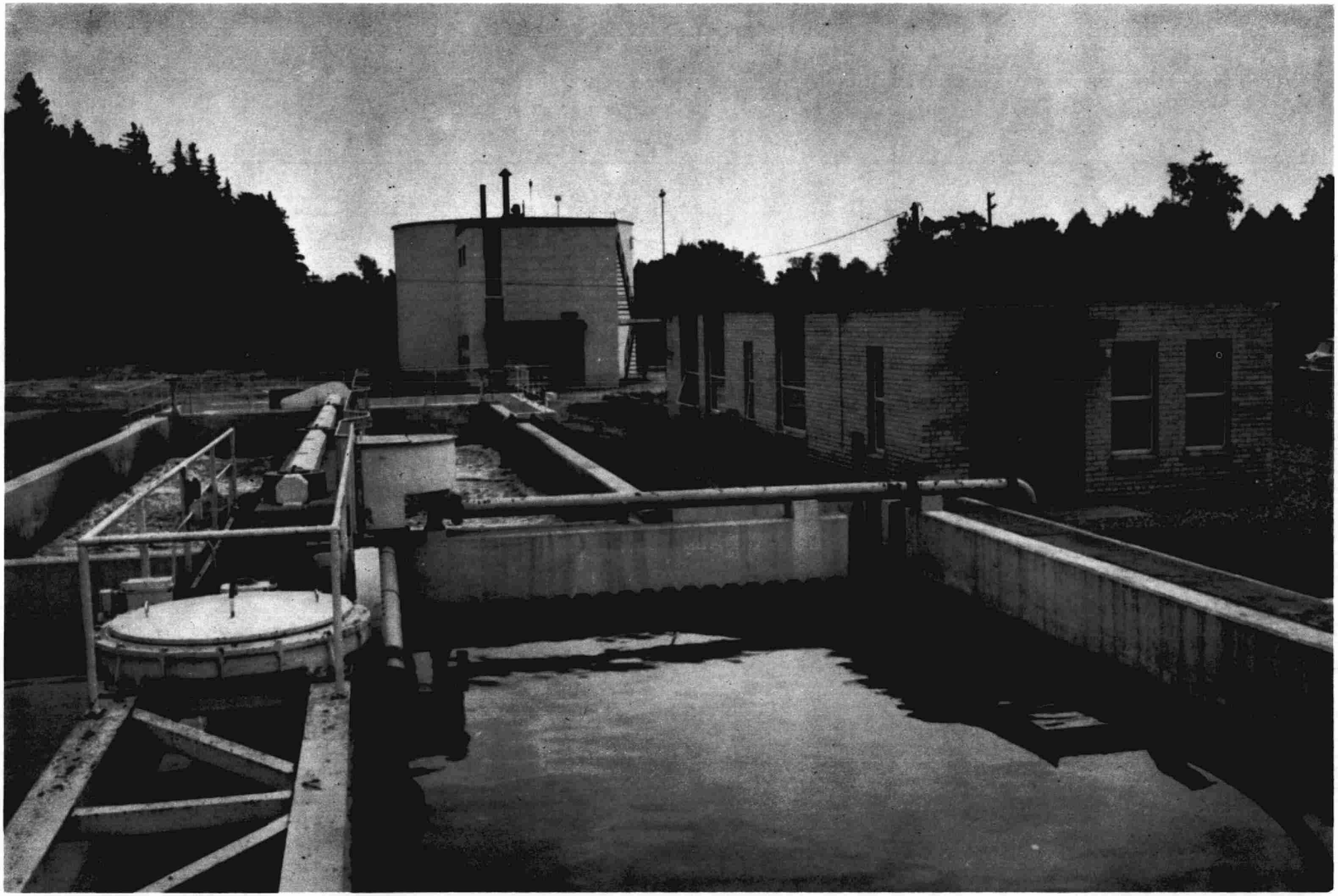
PROJECT OPERATION STATEMENT

MONTH	EXPENDITURE	PAYROLL	WATER	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIP-MENT	REPAIR AND MAINT.	SUNDRY	BUDGET 1962	ACTUAL 1962
JANUARY	738.79	589.50	24.48	.	80.53		35.04	9.24			1,050	739
FEBRUARY	1256.84	606.52		89.49	73.81		11.62		452.97	22.43	2,100	1,996
MARCH	936.65	606.52			69.60		108.87	80.08		79.58	3,150	2,933
APRIL	734.65	606.52	6.75		69.60		18.87			32.91	4,200	3,668
MAY	980.04	666.78		104.01	66.38		122.84			20.03	5,250	4,648
JUNE	758.21	618.76		11.75	66.38		24.00			37.32	6,300	5,406
JULY	939.94	618.76	40.68	14.32	83.78	32.13	30.09			120.18	7,350	6,345
AUGUST	1090.96	928.14		18.65	103.61		23.53			17.03	8,400	7,436
SEPT.	851.01	618.76			104.39		58.53		18.80	44.53	9,450	8,281
OCT.	906.75	618.76	53.64		111.30		76.62		35.75	10.68	10,500	9,188
NOV.	1175.12	618.76		105.66	115.33		55.59	144.29	106.36	29.13	11,550	10,363
DEC.	1658.00	1026.17		130.64	94.70		25.63		344.00	36.86	12,600	12,021
TOTAL	12020.96	8123.95	125.55	474.52	1039.41	32.13	583.23	233.61	957.88	450.68	12,600	12,021
AVERAGE PER MON.	1001.75	677.00	10.46	39.54	86.62	2.68	48.60	19.47	79.82	37.56	1,050	1,002

RECOMMENDATIONS FOR FUTURE DEVELOPMENTS

The machinery room and the doors to the machinery room and chlorination room will be painted in 1963 along with the concrete of the influent works, primary and final clarifiers and aeration tank. As the insultation for the digester is still under the five year warranty, the manufacturer will be asked to inspect and repair the new hairline cracks that have developed since the first ones were patched in 1962. Counter weights and a differential bubble control will be added to the barminutor to reduce the strain and wear on it. More improvements will be made to the grounds next year. The lawn will be extended and trees will be planted around the plant. Also next year the prospect of hauling wet digested sludge will be investigated.

The plant will again be supervised closely during the year to ensure that it operates at its peak efficiency.



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